ENVIROPLAN CONSULTING

PROJECTED PM2.5 ATTAINMENT

STATUS OF EACH COUNTY IN THE U.S.

AND PROJECTED IMPACT ON

POWER GENERATION FACILITIES

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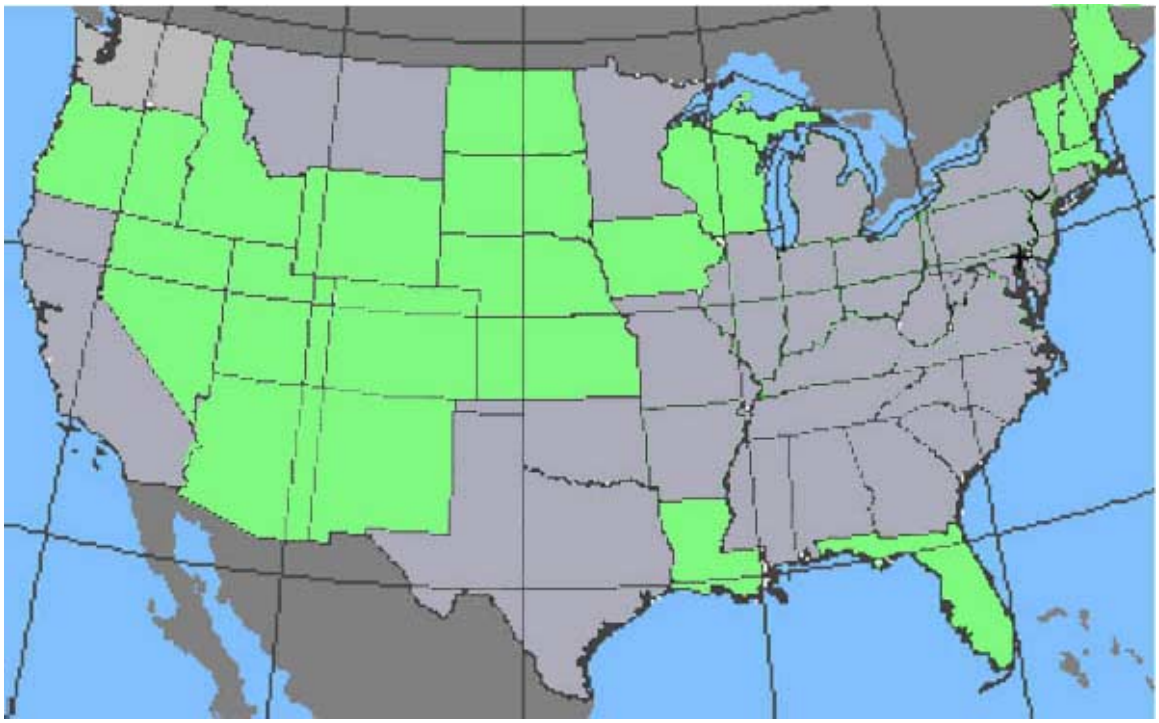
STATES PROJECTED TO HAVE ONE OR MORE COUNTIES DESIGNATED NONATTAINMENT FOR THE ANNUAL PM2.5 STANDARD



Non Attainment

Attainment

BACKGROUND ON THE PM2.5 NAAQS

- Promulgated on July 18, 1997

- Annual PM2.5 NAAQS:

  15.0 ug/m3 based on 3-year rolling average

- 24-hour PM2.5 NAAQS:

  65 ug/m3 measured by the 98th percentile of the 24-hour PM2.5 concentrations per year averaged over 3 years

BACKGROUND ON THE PM2.5 NAAQS

- Attainment of the annual PM2.5 NAAQS based on measurements at **single** community-oriented monitor sites or the average measurements at **multiple** community-oriented monitor sites

- Attainment of 24-hour PM.5 NAAQS based on measurements at each **single** population-oriented monitor

BACKGROUND ON THE PM2.5 NAAQS

- In May 2001, the Supreme Court ruled in favor of the promulgated PM2.5 NAAQS except for certain issues remanded to the Court of Appeals for the District of Columbia

- On March 26, 2002 , the DC Court of Appeals ruled to affirm the promulgated standards

SCHEDULE FOR IMPLEMENTATION OF THE NAAQS FOR PM2.5

- In 1999, the Transportation Equity Act for the 21st Century was passed and signed into law

- It specified the following detailed schedule for implementation of the PM2.5 NAAQS:

  - States must propose nonattainment designations within one year of collection of 3 years of valid monitoring data and no later than December 31, 2003

  - U.S. EPA must finalize nonattainment designations no later than December 31, 2005

PURPOSE OF THIS STUDY

- Project the PM2.5 attainment status of each county in the U.S. based on 1999 and 2000 PM2.5 monitoring data

- Discuss the impact of these designations on existing and planned new power generation facilities

PROCEDURES

- Calculate the 1999-2000 annual average PM2.5 concentration for each monitor in each county in the U.S. from U.S. EPA Aerometric Retrieval System (AIRS) Database

- Identify the monitor in each county with the highest 1999-2000 annual average PM2.5 concentration

- Project the attainment status of each county based on the highest 1999-2000 annual average PM2.5 concentration in the county

PROCEDURES

- Assess the magnitude of the PM2.5 emission reductions needed in each state to attain the NAAQS

- Do this by determining the needed average percent reduction in annual average PM2.5 concentrations to attain the NAAQS

- Average over the highest annual average concentration in each county exceeding 15.0 ug/m3

LIMITATIONS OF THESE PROCEDURES

- The highest 1999-2000 annual average concentration in a county may not be at a “representative community-oriented” monitor and would not be used for the attainment designation

- The agency implementing the PM2.5 NAAQS may choose to compare the annual NAAQS of 15.0 ug/m3 to the concentration resulting from the average over multiple “representative community-oriented” monitors

RESULTS

- 28 states plus the District of Columbia have 1999-2000 annual average PM2.5 concentrations exceeding 15.0 ug/m3 in one or more counties

- In only four of these states does the needed average percent reduction in annual average PM2.5 concentrations to attain the NAAQS exceed 25%

  - California (43.1%)
  - Oklahoma (31.3%)
  - Michigan (28.3%)
  - Georgia (25.8%)

Table 1: States Sorted By Percentage of Counties Projected to be Non-Attainment for PM2.5 Annual NAAQS Based on 1999-2000 Annual Average Concentrations

State	Number of Counties with PM2.5 samplers	Percent of Counties with PM 2.5 Samplers Exceeding 15.0 ug/m3 Annual Average Concentration for 1999-2000 (%)
District of Columbia	1	100.0
Georgia	20	100.0
Alabama	17	94.1
Tennessee	14	92.9
Ohio	19	84.2
Mississippi	15	73.3
North Carolina	30	70.0
West Virginia	14	64.3
Indiana	18	55.6
California	42	50.0
Illinois	19	47.4
Kentucky	18	44.4
Maryland	7	42.9
Pennsylvania	24	41.7
Arkansas	18	33.3
Delaware	3	33.3
Rhode Island	3	33.3
South Carolina	15	33.3
Virginia	7	28.6
Connecticut	4	25.0
New Jersey	12	25.0
New York	22	18.2
Montana	9	11.1
Missouri	13	7.7
Washington	14	7.1
Michigan	18	5.6

Table 1: States Sorted By Percentage of Counties Projected to be Non-Attainment for PM2.5 Annual NAAQS Based on 1999-2000 Annual Average Concentrations

State	Number of Counties with PM2.5 samplers	Percent of Counties with PM 2.5 Samplers Exceeding 15.0 ug/m3 Annual Average Concentration for 1999-2000 (%)
Minnesota	19	5.3
Oklahoma	19	5.3
Texas	24	4.2
Alaska	6	0.0
Arizona	6	0.0
Colorado	17	0.0
Florida	19	0.0
Hawaii	2	0.0
Idaho	12	0.0
Iowa	14	0.0
Kansas	6	0.0
Louisiana	17	0.0
Maine	9	0.0
Massachusetts	10	0.0
Nebraska	13	0.0
North Dakota	8	0.0
Nevada	3	0.0
New Hampshire	7	0.0
New Mexico	9	0.0
Oregon	16	0.0
South Dakota	5	0.0
Utah	7	0.0
Vermont	4	0.0
Wisconsin	18	0.0
Wyoming	3	0.0

Table 2: Number of Counties in each State with PM2.5 Concentrations Exceeding 15.0 ug/m3 NAAQS and Average Percent Reduction in PM2.5 Concentration Needed to Attain the NAAQS

States	Number of Counties with PM2.5 Concentrations Exceeding 15.0 ug/m3 Annual Standard for 1999-2000	Average Percent Reduction in PM2.5 Concentration for the Sampler with Highest PM2.5 Concentration in Each County Needed to Attain the 15.0 ug/m^3 Annual Standard for 1999-2000 (%)
California	21	43.1
Oklahoma	1	31.3
Michigan	1	28.3
Georgia	20	25.8
New York	4	21.4
Connecticut	1	20.3
Ohio	16	18.3
Alabama	16	18.2
Pennsylvania	10	17.4
District of Columbia	1	16.7
Tennessee	13	16.5
Maryland	3	14.4
West Virginia	9	13.3
Illinois	9	13.2
New Jersey	3	12.8
Arkansas	6	10.4
South Carolina	5	10.3
Indiana	10	10.0
Mississippi	11	9.6
Kentucky	8	9.0

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States	Number of Counties with PM2.5 Concentrations Exceeding 15.0 ug/m3 Annual Standard for 1999-2000	Average Percent Reduction in PM2.5 Concentration for the Sampler with Highest PM2.5 Concentration in Each County Needed to Attain the 15.0 ug/m^3 Annual Standard for 1999-2000 (%)
Montana	1	8.8
North Carolina	21	8.0
Minnesota	1	7.9
Washington	1	7.9
Delaware	1	7.0
Texas	1	5.7
Rhode Island	1	1.4
Missouri	1	1.2
Virginia	2	0.8
Hawaii	0	0.0
Alaska	0	0.0
Arizona	0	0.0
Colorado	0	0.0
Florida	0	0.0
Idaho	0	0.0
Iowa	0	0.0
Kansas	0	0.0
Louisiana	0	0.0
Maine	0	0.0
Massachusetts	0	0.0
Nebraska	0	0.0
North Dakota	0	0.0
Nevada	0	0.0

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States	Number of Counties with PM2.5 Concentrations Exceeding 15.0 ug/m3 Annual Standard for 1999-2000	Average Percent Reduction in PM2.5 Concentration for the Sampler with Highest PM2.5 Concentration in Each County Needed to Attain the 15.0 ug/m^3 Annual Standard for 1999-2000 (%)
New Hampshire	0	0.0
New Mexico	0	0.0
Oregon	0	0.0
South Dakota	0	0.0
Utah	0	0.0
Vermont	0	0.0
Wisconsin	0	0.0
Wyoming	0	0.0

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- States must propose nonattainment designations by no later than December 31, 2003

- U.S. EPA must promulgate its nonattainment designations for PM2.5 by no later than December 31, 2005

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- States must submit State Implementation Plans (SIPs) for attaining the NAAQS within 3 years after the nonattainment designations

- U.S. EPA has 12 months after SIP submittal to promulgate final SIPs to attain the NAAQS

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- U.S. EPA has only begun to develop approaches for attaining the PM2.5 NAAQS
- One approach under consideration is to focus on the PM2.5 monitor sites and make attainment demonstrations at these monitor sites

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- A second area under consideration is whether to use a "Secondary First" or "Primary First" approach to reducing PM2.5 emissions to attain the NAAQS

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- "Secondary First" consists of:

  - focusing first on reduction in emissions of precursors to PM2.5 concentrations such as SO2, NOx and certain organic chemicals that chemically transform into PM2.5 over time

  - focusing on primary PM2.5 emissions reductions to deal only with residual nonattainment cases

  - this approach results in potentially large further emission reductions from existing power plants

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- "Primary First" consists of:

  - focusing first on identifying the specific local sources contributing to the primary PM2.5 concentrations exceeding the NAAQS

  - assessing the feasibility of attaining the NAAQS by reducing primary source emissions

  - making primary source emission reductions where feasible

  - focusing on secondary PM2.5 emissions reductions to deal only with residual nonattainment cases

IMPACT OF THESE DESIGNATIONS ON EXISTING POWER GENERATION FACILITIES

- Whether a “Primary First” or “Secondary First” PM2.5 control strategy is used may have a profound impact on the costs of compliance with the PM2.5 NAAQS

IMPACT OF THESE DESIGNATIONS ON NEW POWER GENERATION FACILITIES

- Major new sources and major modifications to existing sources in nonattainment areas are subject to state new source review requirements at least as stringent as 40 CFR Part 51 Appendix S

- These requirements include among others:

  - obtaining emission offsets exceeding the new source emissions

  - Lowest Achievable Emission Rate (LAER) control technology

IMPACT OF THESE DESIGNATIONS ON NEW POWER GENERATION FACILITIES

- Difficulty of obtaining PM2.5 emission offsets
- High potential costs of offsets if available
- Possibility of substituting SO2 or NOx emission offsets as precursors of PM2.5
- Potentially large costs of PM2.5 LAER control technology

CONCLUSION

The impending widespread nonattainment designations for PM2.5 may have profound effects on the costs of existing and new power generation facilities in this decade.